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L46 ANSWER 1 OF 8 HCPLUS COPYRIGHT 2009 ACS on STN

AN 2009:53007 HCPLUS Full-text

DN 150:97508

TI Reducing the phosphorus content of liquid manure

IN Pietola, Liisa; Kulokoski, Ulla

PA Yara Suomi Oy, Finland

SO PCT Int. Appl., 38pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2009007514	A2	20090115	WO 2008-FI50426	20080711
	W:	AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW			
	RW:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			

PRAI FI 2007-545

A 20070712

FI 2008-5608 A 20080618

AB A treatment for reduction of phosphorus in liquid manure is described. The amount of water-soluble phosphorus of liquid manure is easily and effectively reduced by adding thereto a precipitation product containing calcium and magnesium compds. After the treatment, the liquid portion of the liquid manure that is treated by the method can be pumped back to the fields of the farm as fertilizers. The precipitation product according to the invention is easy to use in the farm environment and it is also suited to be used to considerably decrease the phosphorus content of the filtered liquors of dry manure.

CC 19-6 (Fertilizers, Soils, and Plant Nutrition)

ST phosphorus pptn liq manure calcium magnesium

IT Manure  
 (farmyard; reducing phosphorus content of liquid manure)

IT Precipitation (chemical)  
 (reducing phosphorus content of liquid manure)

IT 7398-69-8, Diallyl dimethyl ammonium chloride  
 RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)  
 (reducing phosphorus content of liquid manure)

IT 1309-48-4, Magnesium oxide, biological studies  
 7439-95-4D, Magnesium, compds. 7778-18-9, Calcium sulfate 13397-24-5, Gypsum, biological studies 14567-64-7, Kieserite  
 RL: AGR (Agricultural use); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process); USES (Uses)  
 (reducing phosphorus content of liquid manure)

IT 9003-05-8, Polyacrylamide 1095462-76-2, Fennopol K 3459  
 RL: AGR (Agricultural use); POF (Polymer in formulation); BIOL (Biological study); USES (Uses)  
 (reducing phosphorus content of liquid manure)

IT 7723-14-0, Phosphorus, processes  
 RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)  
 (reducing phosphorus content of liquid manure)

IT 7439-95-4D, Magnesium, compds.  
 RL: AGR (Agricultural use); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process); USES (Uses)  
 (reducing phosphorus content of liquid manure)

RN 7439-95-4 HCAPLUS

CN Magnesium (CA INDEX NAME)

Mg

IT 7723-14-0, Phosphorus, processes  
 RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)  
 (reducing phosphorus content of liquid manure)

RN 7723-14-0 HCAPLUS

CN Phosphorus (CA INDEX NAME)

P

AN 2007:349031 HCPLUS Full-text  
 DN 146:467463  
 TI Precipitation of liquid swine manure  
     phosphates using magnesium smelting by-  
     products  
 AU Parent, Gaetan; Belanger, Gilles; Ziadi, Noura; Deland,  
     Jean-Pierre; Laperriere, Jean  
 CS Soils and Crops Research and Development Centre, Agriculture and Agri-Food  
     Canada, Quebec, QC, G1V 2J3, Can.  
 SO Journal of Environmental Quality (2007), 36(2), 557-567  
 CODEN: JEVQAA; ISSN: 0047-2425  
 PB American Society of Agronomy  
 DT Journal  
 LA English  
 AB Swine manure contains considerable amts. of total (P) and soluble P (PO43--P)  
     which may increase the soil P content when applied in excess to crop  
     requirements and, consequently, risk water eutrophication. The feasibility of  
     using Mg from the byproduct of electrolysis and foundries (BPEF) for the  
     removal of P from liquid swine manure was studied by adding ≤3 g Mg as BPEF/L  
     nursery (NU) and grower-finisher (GF) swine manure in 25-L plastic buckets.  
     Changes in P and other elements were monitored for ≤360 h. Small amts. of Mg  
     as BPEF (0.5 and 1.0 g Mg/L manure) reduced the P concentration of the liq.  
     fraction by 70-95% of both manure types with respect to the control treatment  
     of mixed raw manure. A settling period of ≥8 h was necessary to significantly  
     reduce the liquid fraction P concentration for both manure types. Reduction  
     of PO43--P was 96-100% in the liquid fractions for both manure types, which  
     along with natural settling, explains most of the total P reduction in that  
     fraction. The addition of BPEF did not influence the N content of manure.  
     The low P liquid fraction can be safely applied to saturated P soils whereas  
     the high P solid fraction offers the opportunity of transporting manure to  
     agricultural soils deficient in P. Since N is conserved, both liquid and  
     solid fractions could be valuable fertilizer manure byproducts.  
 CC 60-4 (Waste Treatment and Disposal)  
 Section cross-reference(s): 19, 61  
 ST pptn liq swine manure phosphate  
     magnesium smelting byproduct  
 IT Foundries  
     Manure  
         (precipitation of liquid swine manure  
             phosphates using magnesium smelting  
             byproducts)  
 IT Fertilizers  
     RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)  
         (precipitation of liquid swine manure  
             phosphates using magnesium smelting  
             byproducts)  
 IT Phosphates, processes  
     RL: REM (Removal or disposal); PROC (Process)  
         (precipitation of liquid swine manure  
             phosphates using magnesium smelting  
             byproducts)  
 IT 7439-95-4, Magnesium, uses  
     RL: NUU (Other use, unclassified); USES (Uses)  
         (precipitation of liquid swine manure  
             phosphates using magnesium smelting  
             byproducts)  
 IT 7440-70-2, Calcium, occurrence 7727-37-9, Nitrogen, occurrence  
     RL: OCU (Occurrence, unclassified); OCCU (Occurrence)  
         (precipitation of liquid swine manure

phosphates using magnesium smelting byproducts)

IT 7723-14-0, Phosphorus, processes  
 RL: REM (Removal or disposal); PROC (Process)  
 (precipitation of liquid swine manure  
 phosphates using magnesium smelting  
 byproducts)

IT 7439-95-4, Magnesium, uses  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (precipitation of liquid swine manure  
 phosphates using magnesium smelting  
 byproducts)

RN 7439-95-4 HCAPLUS

CN Magnesium (CA INDEX NAME)

Mg

IT 7723-14-0, Phosphorus, processes  
 RL: REM (Removal or disposal); PROC (Process)  
 (precipitation of liquid swine manure  
 phosphates using magnesium smelting  
 byproducts)

RN 7723-14-0 HCAPLUS

CN Phosphorus (CA INDEX NAME)

P

RE.CNT 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L46 ANSWER 3 OF 8 HCAPLUS COPYRIGHT 2009 ACS on STN  
 AN 2007:338918 HCAPLUS Full-text  
 DN 147:37379  
 TI Using a chemical equilibrium model to predict amendments required to precipitate phosphorus as struvite in liquid swine manure  
 AU Celen, Ipek; Buchanan, John R.; Burns, Robert T.; Robinson, R. Bruce; Raman, D. Raj  
 CS Biosystems Engineering and Soil Science, The University of Tennessee, Knoxville, TN, 37996 4531, USA  
 SO Water Research (2007), 41(8), 1689-1696  
 CODEN: WATRAG; ISSN: 0043-1354  
 PB Elsevier Ltd.  
 DT Journal  
 LA English  
 AB Precipitation of phosphate minerals from liquid swine manure is an established means of reducing the orthophosphate (OP) concentration. This project studied the usefulness of a chemical equilibrium model, Visual Minteq, for prescribing the amendments needed to maximize struvite precipitation from liquid swine manure and thus reduce the OP-P concentration. The actual concns. of Mg<sup>2+</sup>, Ca<sup>2+</sup>, K<sup>+</sup>, OP, NH<sup>4+</sup>, alkalinity and pH of the liquid swine manure system were used as inputs to the model. The model was modified to remove species with extremely low formation rates, because they would not significantly precipitate in the reaction occurring in a short retention-time process such

as those envisioned for swine manure struvite-formation reactors. Using the model's output, a series of 19-L reactors were used to verify the results. Verification results demonstrated that Visual Minteq can be used to pre-determine the concentration of amendments required to maximize struvite recovery.

CC 60-4 (Waste Treatment and Disposal)  
 ST chem equil model amendment pptn phosphorus struvite swine  
 manure  
 IT Alkalinity  
     Manure  
     Optimization  
     Simulation and Modeling  
       (using chemical equilibrium model to predict amendments required to  
       precipitate phosphorus as struvite in liquid swine manure)  
 IT Phosphates, processes  
     RL: REM (Removal or disposal); PROC (Process)  
       (using chemical equilibrium model to predict amendments required to  
       precipitate phosphorus as struvite in liquid swine manure)  
 IT 15490-91-2P, Struvite  
     RL: FMU (Formation, unclassified); PUR (Purification or recovery); FORM  
       (Formation, nonpreparative); PREP (Preparation)  
       (using chemical equilibrium model to predict amendments required to  
       precipitate phosphorus as struvite in liquid swine manure)  
 IT 7439-95-4, Magnesium, occurrence 7440-09-7, Potassium,  
 occurrence 7440-70-2, Calcium, occurrence 14798-03-9, Ammonium,  
 occurrence  
     RL: POL (Pollutant); OCCU (Occurrence)  
       (using chemical equilibrium model to predict amendments required to  
       precipitate phosphorus as struvite in liquid swine manure)  
 IT 7723-14-0, Phosphorus, processes  
     RL: REM (Removal or disposal); PROC (Process)  
       (using chemical equilibrium model to predict amendments required to  
       precipitate phosphorus as struvite in liquid swine manure)  
 IT 7439-95-4, Magnesium, occurrence  
     RL: POL (Pollutant); OCCU (Occurrence)  
       (using chemical equilibrium model to predict amendments required to  
       precipitate phosphorus as struvite in liquid swine manure)  
 RN 7439-95-4 HCPLUS  
 CN Magnesium (CA INDEX NAME)

Mg

IT 7723-14-0, Phosphorus, processes  
 RL: REM (Removal or disposal); PROC (Process)  
       (using chemical equilibrium model to predict amendments required to  
       precipitate phosphorus as struvite in liquid swine manure)  
 RN 7723-14-0 HCPLUS  
 CN Phosphorus (CA INDEX NAME)

P

L46 ANSWER 4 OF 8 HCPLUS COPYRIGHT 2009 ACS on STN  
 AN 2007:71399 HCPLUS Full-text  
 DN 147:100745  
 TI Biosolids and sustainable agriculture: the cove area regional digester manure and biosolids processing facility  
 AU Wert, Jason D.; Dick, Julie; Siegfried, Steven M.; Delphos, Paul J.  
 CS Herbert, Rowland & Grubic, Inc., State College, PA, 16801, USA  
 SO WEFTEC.05, Conference Proceedings, Annual Technical Exhibition & Conference, 78th, Washington, DC, United States, Oct. 29-Nov. 2, 2005 (2005), 6504-6512 Publisher: Water Environment Federation, Alexandria, Va.  
 CODEN: 69JOAM  
 DT Conference; (computer optical disk)  
 LA English  
 AB Over the past several years, the Cove Area Regional Digester Project has been studied to deal with numerous issues that face the Borough of Martinsburg and its surrounding communities that form an area known as Morrison's Cove, in Blair and Bedford Counties, Pennsylvania. This densely populated agricultural community is home to over 25,000 head of dairy animals and is located in the middle of the pristine Clover Creek Watershed. In recent times, many of the larger operations have converted to liquid manure application to dispose of the estimated 200 tons of manure produced daily within the Cove. While most of the agricultural operations follow existing nutrient management plans, changing regulations have begun to impact manure disposal operations. Many fields within the Cove have been identified as exceeding maximum recommended limits for phosphorus. While these fields can possibly meet future nitrogen regulations, the long-term viability of complying with proposed phosphorus limits is extremely unlikely. At this time, no viable option exists for the existing agricultural operations, which range in size from 80 animals to in excess of 2,200 animals, to dispose of excess manure. This will force many operations to consider alternative implementation plans for their manure products, increasing costs. Linked with the disposal of manure, the public water supply of the Cove consists of groundwater supply wells. Located in a karst geol. region, agricultural runoff has steadily increased nitrate pollution to the point that two of the four wells that supply Martinsburg Borough now require treatment as they exceed 10 mg/l (Federal/State Maximum for Nitrates in Potable Supplies). In addition, numerous private wells and water supplies have been neg. impacted by the runoff. In light of these multiple environmental and economic problems, the Agriculture Today and Tomorrow Committee was formed to develop solns. and weigh their advantages and disadvantages. After several years of work, the concept, and now preliminary design, of the Cove Area Regional Digester has been completed.  
 CC 60-4 (Waste Treatment and Disposal)  
 ST digester biosolid agriculture manure Pennsylvania  
 IT Runoff  
     (agricultural; design of cove area regional digester for manure treatment and disposal system for local agricultural and municipal community of Western Pennsylvania)  
 IT Digestion, biological  
     (anaerobic; design of cove area regional digester for manure treatment and disposal system for local agricultural and municipal community of Western Pennsylvania)  
 IT Chemical oxygen demand  
 Economics  
     Manure  
 Wastewater treatment  
 Wastewater treatment sludge  
     .design of cove area regional digester for manure treatment and disposal system for local agricultural and municipal community of Western Pennsylvania)  
 IT Nitrates, processes

RL: BCP (Biochemical process); POL (Pollutant); REM (Removal or disposal); BIOL (Biological study); OCCU (Occurrence); PROC (Process)  
 (design of cove area regional digester for manure treatment  
 and disposal system for local agricultural and municipal community of  
 Western Pennsylvania)

IT Drying  
 (dewatering; design of cove area regional digester for manure  
 treatment and disposal system for local agricultural and municipal  
 community of Western Pennsylvania)

IT Solids  
 (suspended; design of cove area regional digester for manure  
 treatment and disposal system for local agricultural and municipal  
 community of Western Pennsylvania)

IT 7723-14-0, Phosphorus, processes 7727-37-9, Nitrogen, processes  
 RL: BCP (Biochemical process); POL (Pollutant); REM (Removal or  
 disposal); BIOL (Biological study); OCCU (Occurrence); PROC (Process)  
 (design of cove area regional digester for manure treatment  
 and disposal system for local agricultural and municipal community of  
 Western Pennsylvania)

IT 7723-14-0, Phosphorus, processes  
 RL: BCP (Biochemical process); POL (Pollutant); REM (Removal or  
 disposal); BIOL (Biological study); OCCU (Occurrence); PROC (Process)  
 (design of cove area regional digester for manure treatment  
 and disposal system for local agricultural and municipal community of  
 Western Pennsylvania)

RN 7723-14-0 HCPLUS  
 CN Phosphorus (CA INDEX NAME)

P

L46 ANSWER 5 OF 8 HCPLUS COPYRIGHT 2009 ACS on STN  
 AN 2005:153308 HCPLUS Full-text  
 DN 142:468374  
 TI Tertiary treatment of the liquid fraction of pig  
 manure with Phragmites australis  
 AU Meers, Erik; Rousseau, Diederik P. L.; Blomme, Nathalie; Lesage, Els; Du  
 Laing, Gijs; Tack, Filip M. G.; Verloo, Marc G.  
 CS Department of Applied Analytical and Physical Chemistry, Laboratory of  
 Analytical Chemistry and Applied Ecochemistry, Ghent University, Ghent,  
 9000, Belg.  
 SO Water, Air, & Soil Pollution (2005), 160(1-4), 15-26  
 CODEN: WAPLAC; ISSN: 0049-6979  
 PB Springer  
 DT Journal  
 LA English  
 AB Since 2003, the pig industry in Flanders (Belgium) is obliged to process a  
 portion of the nutrient overprodn. In general, pig manure processing occurs  
 as follows: (1) separation into liquid and solid fractions, (2) conversion of  
 the solid fraction to an exportable product (e.g. composting) and (3)  
 reduction of nutrient contents in the liquid fraction before discharge into  
 surface water or spreading on arable land. The aim was to evaluate the  
 potential of constructed wetlands (CWS) planted with Phragmites australis to  
 reduce N, P and COD in the liquid fraction to levels below discharge criteria.  
 The removal efficiency of heavy metals (Cu, Zn) present at elevated levels in  
 the liquid fraction was evaluated. A greenhouse experiment was conducted with  
 subsurface flow (SSF) reed beds (2 + 0.125 + 0.11 m) filled with sand, loam,

clayey sand or expanded clay (argex). The liquid manure load was set at 1 mm/day. Removal efficiencies were 64-75% COD, 73-83% N and 71-92% P, depending on the matrix material used. However, effluent levels still remained significantly above the Flemish legal discharge criteria of 2, 15 and 125 mg/L for P, N and COD, resp.

CC 60-1 (Waste Treatment and Disposal)  
 ST tertiary treatment liq pig manure Phragmites  
 IT Wastewater treatment  
     (land application, wetland; tertiary treatment of liquid fraction of pig manure with *Phragmites australis*)  
 IT *Phragmites australis*  
     (tertiary treatment of liquid fraction of pig manure with *Phragmites australis*)  
 IT Nitrates, processes  
   RL: BSU (Biological study, unclassified); REM (Removal or disposal); BIOL (Biological study); PROC (Process)  
     (tertiary treatment of liquid fraction of pig manure with *Phragmites australis*)  
 IT Heavy metals  
   RL: REM (Removal or disposal); PROC (Process)  
     (tertiary treatment of liquid fraction of pig manure with *Phragmites australis*)  
 IT 7440-50-8, Copper, processes 7440-66-6, Zinc, processes  
 7723-14-0, Phosphorus, processes 7727-37-9, Nitrogen, processes  
 14798-03-9, Ammonium, processes  
   RL: REM (Removal or disposal); PROC (Process)  
     (tertiary treatment of liquid fraction of pig manure with *Phragmites australis*)  
 IT 7723-14-0, Phosphorus, processes  
   RL: REM (Removal or disposal); PROC (Process)  
     (tertiary treatment of liquid fraction of pig manure with *Phragmites australis*)  
 RN 7723-14-0 HCAPLUS  
 CN Phosphorus (CA INDEX NAME)

P

RE.CNT 14        THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L46 ANSWER 6 OF 8 HCAPLUS COPYRIGHT 2009 ACS on STN  
 AN 2002:869337 HCAPLUS Full-text  
 DN 137:374571  
 TI System and method for separating components of liquid manure  
 IN Dutil, Camil; Gagne, Gilles; Chabot, Rock; Comeau, Yves  
 PA Envirogain Inc., Can.  
 SO U.S. Pat. Appl. Publ., 10 pp.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 20020166819 CA 2381681	A1	20021114 20021012	US 2002-120776 CA 2002-2381681	20020412 20020412
PRAI	US 2001-283149P	P	20010412		

AB The present invention relates to a system and method for the treatment of liquid manure, particularly pig manure , and wastewater produced in by animals. The method comprises the combined application of filtration, bioreaction, and electrochem. treatment, namely electroflotation, to effect separation of contaminants from the water fraction. The treatment system comprises at least one of a separation system for separating liquid phase and solid phase of liq . manure or a bioreactor for clarifying separated liquid phase by aeration to obtain clarified aqueous phase, in combination with an electrochem. system inducing at least one of a flocculation, coagulation or disinfection of particles contained in the clarified aqueous phase. The separation system performs at least one of sifting, riddling, filtration, settling, sedimentation, or pressing. Filtration is performed with a membrane filter, porous hard wall, cloth drum type, or tangential filtration. The solid phase may be recovered as a fertilizer or a soil additive.

IC ICM CO2F0001-00

INCL 210696000

CC 60-1 (Waste Treatment and Disposal)

Section cross-reference(s) : 19

ST liq manure sepn filtration bioreaction  
electroflotation treatment fertilizer

IT Wastewater treatment

(aeration; combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT Wastes

(animal, wastewater; combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT Wastewater treatment

(biol.; combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT Wastewater treatment

(clarification; combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT Wastewater treatment

(coagulation; combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT Anions

Cations

Manure

(combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT Fertilizers

RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT Wastewater treatment

(disinfection; combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT Wastewater treatment

(electroflotation; combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT Wastewater treatment

(filtration; combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid

manure)

IT Wastewater treatment  
(flocculation; combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT Filters  
(membrane filter, porous hard wall, cloth drum type, or tangential filter; combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT Particles  
(metal, flocculant; combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT 7723-14-0D, Phosphorus, compds. 7727-37-9D, Nitrogen, compds.  
RL: BCP (Biochemical process); REM (Removal or disposal); BIOL (Biological study); PROC (Process)  
(combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT 7429-90-5D, Aluminum, salts 7439-89-6D, Iron, salts 7439-95-4D  
, Magnesium, salts 7705-08-0, Ferric chloride, uses  
7720-78-7, Ferrous sulfate 7758-94-3, Ferrous chloride 10028-22-5,  
Ferric sulfate 10028-22-5D, Ferric sulfate, chlorinated 55892-56-3,  
Basic aluminum sulfate 55892-56-3D, Sulfuric acid, aluminum salt, basic,  
chlorinated  
RL: NUU (Other use, unclassified); USES (Uses)  
(combined application of filtration, bioreaction, and electrochem.  
treatment for separating components of liquid manure)

IT 7487-88-9, Magnesium sulfate, uses 7786-30-3,  
Magnesium chloride, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(flocculant; combined application of filtration, bioreaction, and electrochem. treatment for separating components of liquid manure)

IT 7723-14-0D, Phosphorus, compds.  
RL: BCP (Biochemical process); REM (Removal or disposal); BIOL (Biological study); PROC (Process)  
(combined application of filtration, bioreaction, and electrochem.  
treatment for separating components of liquid manure)

RN 7723-14-0 HCAPLUS  
CN Phosphorus (CA INDEX NAME)

P

IT 7439-95-4D, Magnesium, salts  
RL: NUU (Other use, unclassified); USES (Uses)  
(combined application of filtration, bioreaction, and electrochem.  
treatment for separating components of liquid manure)

RN 7439-95-4 HCAPLUS  
CN Magnesium (CA INDEX NAME)

Mg

L46 ANSWER 7 OF 8 HCAPLUS COPYRIGHT 2009 ACS on STN  
 AN 1999:697796 HCAPLUS Full-text  
 DN 131:290734  
 TI Treatment of organic wastes by anaerobic fermentation  
 IN Moro, Masashi; Soeda, Yuji; Yamamoto, Tetsuya; Shibata, Toshiyuki;  
 Komatsu, Toshihiro  
 PA Kubota, Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 4 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11300311 JP 3835927	A B2	19991102 20061018	JP 1998-112582	19980423
PRAI	JP 1998-112582		19980423		
AB	The method comprises passing organic wastes, livestock manure or agricultural sludge slurries through a solid-liq . separator to give dewatered sludge, mixing the dewatered sludge with pulverized trash or food wastes and anaerobic fermentation of the mixture to recover CH <sub>4</sub> gases as a byproduct, filtering liq . stream from the separator to remove residual sludge, dephosphorizing the filtrate in a precipitation tank to recover the crystalline MgNH <sub>4</sub> PO <sub>4</sub> ppts. useful as feedstock for organic fertilizer manufacturing, and then biol. treatment of the dephosphorized liquid to obtain a clean water.				
IC	ICM B09B0003-00				
CC	60-4 (Waste Treatment and Disposal)				
ST	org waste anaerobic fermn methane prodn; livestock manure food waste anaerobic fermn; dephosphorization manure fecal waste compost fertilizer				
IT	Wastewater treatment (coagulation; in methane gas formation from treatment of organic wastes by anaerobic fermentation)				
IT	Wastewater treatment (dephosphorization; in methane gas formation from treatment of organic wastes by anaerobic fermentation)				
IT	Fertilizers RL: PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PREP (Preparation); PROC (Process) (feedstock, manufacture of, from treatment of organic wastes by anaerobic fermentation)				
IT	Wastewater treatment (precipitation; in methane gas formation from treatment of organic wastes by anaerobic fermentation)				
IT	Manure Wastes (treatment of organic wastes by anaerobic fermentation)				
IT	7785-21-9P, Ammonium magnesium phosphate RL: PUR (Purification or recovery); PREP (Preparation) (formation of crystalline; from treatment of organic wastes by anaerobic fermentation)				
IT	74-82-8P, Methane, preparation RL: PUR (Purification or recovery); PREP (Preparation) (formation of; from treatment of organic wastes by anaerobic fermentation)				

L46 ANSWER 8 OF 8 HCAPLUS COPYRIGHT 2009 ACS on STN  
 AN 1998:457151 HCAPLUS Full-text

DN 129:99420  
 OREF 129:20395a, 20398a  
 TI Separation of raw agricultural waste  
 IN Miknevich, Joseph P.; Hassick, Denis E.  
 PA Calgon Corp., USA  
 SO U.S., 8 pp.  
 CODEN: USXXAM

DT Patent  
 LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5776350	A	19980707	US 1996-716827	19960912
PRAI	US 1996-716827		19960912		

AB A method for separating raw agricultural waste into a liquid portion and a nutrient enriched solids portion is described. This method includes providing raw agricultural waste to be treated, adding to the raw agricultural waste an effective amount of a composition comprising a quaternized amino methylated polyacrylamide polymer for separating the raw agricultural waste into a mixture having a liquid portion and a nutrient solids portion, mixing the composition with the raw agricultural waste to facilitate the separation, and subjecting the mixture to at least one mech. separation means for segregating the separated liquid portion from the separated nutrient solids portion. A method for transforming raw agricultural waste into a clarified liq . portion and a dewatered nutrient enriched solids portion is also provided..

IC ICM C02F0001-56

INCL 210710000

CC 60-4 (Waste Treatment and Disposal)

ST agricultural waste recycling disposal treatment; manure  
recycling disposal treatment

IT Manure

Recycling

Solid wastes

Wastes

(separation of raw agricultural waste)

IT 69418-26-4, Acrylamide-acryloyloxyethyl trimethyl ammonium chloride copolymer 201816-56-0, Excel Ultra 100 209735-42-2, Percol 7972CS

RL: NUU (Other use, unclassified); USES (Uses)

(separation of raw agricultural waste)

IT 7429-90-5, Aluminum, processes 7439-95-4, Magnesium, processes 7439-96-5, Manganese, processes 7440-09-7, Potassium, processes 7440-23-5, Sodium, processes 7440-39-3, Barium, processes 7440-50-8, Copper, processes 7440-66-6, Zinc, processes 7440-70-2, Calcium, processes 7723-14-0, Phosphorus, processes

RL: REM (Removal or disposal); PROC (Process)

(separation of raw agricultural waste)

IT 7439-95-4, Magnesium, processes 7723-14-0,

Phosphorus, processes

RL: REM (Removal or disposal); PROC (Process)

(separation of raw agricultural waste)

RN 7439-95-4 HCAPLUS

CN Magnesium (CA INDEX NAME)

Mg

RN 7723-14-0 HCAPLUS

CN Phosphorus (CA INDEX NAME)

P

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> => fil agricola  
FILE 'AGRICOLA' ENTERED AT 15:42:52 ON 05 FEB 2009

FILE COVERS 1970 TO 6 Jan 2009 (20090106/ED)

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This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d all

L64 ANSWER 1 OF 1 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved.  
(2009) on STN  
AN 2008:14667 AGRICOLA Full-text  
DN IND43995903  
TI Precipitation of Liquid Swine Manure Phosphates Using Magnesium Smelting By-Products.  
AU Parent, G.; Belanger, G.; Ziadi, N.; Deland, J.P.; Laperriere, J.  
AV DNAL (QH540.J6)  
SO Journal of environmental quality, 2007 Mar-Apr Vol. 36, no. 2 p. 557-567  
ISSN: 0047-2425  
NTE Includes references  
DT Article; (ELECTRONIC RESOURCE)  
FS Other US  
LA English  
AB Swine manure contains considerable amounts of total (P) and soluble phosphorus (PO<sub>4</sub>-P) which may increase the soil P content when applied in excess to crop requirements and, consequently, risk water eutrophication. The feasibility of using magnesium (Mg) from the by- product of electrolysis and foundries (BPEF) for the removal of P from liquid swine manure was studied by adding up to 3 g of Mg as BPEF per liter of nursery (NU) and grower-finisher (GF) swine manure in 25-L plastic buckets. Changes in P and other elements were monitored for up to 360 h. Small amounts of Mg as BPEF (0.5 and 1.0 g Mg L<sup>-1</sup> manure) reduced the total P concentration of the liquid fraction by 70 to 95% of both manure types with respect to the control treatment of mixed raw manure. A settling period of 8 h or more was necessary to significantly reduce the liquid fraction's total P concentration for both manure types. Reduction of PO<sub>4</sub>-P varied from 96 to 100% in the liquid fractions for both manure types, which along with natural settling, explains most of the total P reduction in that fraction. The addition of BPEF did not influence the N content of manure. The low P liquid fraction can be safely applied to saturated P soils whereas the high P solid fraction offers the opportunity of transporting manure to

agricultural soils deficient in P. Since N is conserved, both liquid and solid fractions could be valuable fertilizer manure by-products.

CC W000 Pollution

CTLC animal manure management; chemical precipitation; industrial byproducts; liquid manure; magnesium; metallurgy; nitrogen; organic fertilizers; phosphates; phosphorus; pig manure; provenance

GTO Quebec

RN 7439-95-4 (MAGNESIUM)

7723-14-0 (PHOSPHORUS)

7727-37-9 (NITROGEN)

117344-32-8 (BPEF)

=> => fil biosis

FILE 'BIOSIS' ENTERED AT 15:50:26 ON 05 FEB 2009

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FILE COVERS 1926 TO DATE.

CAS REGISTRY NUMBERS AND CHEMICAL NAMES (CNS) PRESENT  
FROM JANUARY 1926 TO DATE.

RECORDS LAST ADDED: 4 February 2009 (20090204/ED)

BIOSIS has been augmented with 1.8 million archival records from 1926 through 1968. These records have been re-indexed to match current BIOSIS indexing.

=> d all tot

L80 ANSWER 1 OF 2 BIOSIS COPYRIGHT (c) 2009 The Thomson Corporation on STN  
AN 2007:284791 BIOSIS Full-text

DN PREV200700285811

TI Precipitation of liquid swine manure phosphates using magnesium smelting by-products.

AU Parent, Gaetan [Reprint Author]; Belanger, Gilles; Ziadi, Noura; Deland, Jean-Pierre; Laperriere, Jean

CS Agr and Agri Food Canada, Soils and Crops Res and Dev Ctr, 2560 Hochelaga Blvd, Quebec City, PQ G1V 2J3, Canada  
parentg@agr.gc.ca

SO Journal of Environmental Quality, (MAR-APR 2007) Vol. 36, No. 2, pp. 557-567.

CODEN: JEVQAA. ISSN: 0047-2425.

DT Article

LA English

ED Entered STN: 2 May 2007

Last Updated on STN: 2 May 2007

AB Swine manure contains considerable amounts of total (P) and soluble phosphorus ( $\text{PO}_4\text{-P}$ ) which may increase the soil P content when applied in excess to crop requirements and, consequently, risk water eutrophication. The feasibility of using magnesium (Mg) from the by-product of electrolysis and foundries (BPEF) for the removal of P from liquid swine manure was studied by adding up to 3 g of Mg as BPEF per liter of nursery (NU) and grower-finisher (GF) swine manure in 25-L plastic buckets. Changes in P and other elements were monitored for up to 360 h. Small amounts of Mg as BPEF (0.5 and 1.0 g Mg L<sup>-1</sup> manure) reduced the total P concentration of the liquid fraction by 70 to 95% of both manure types with respect to the control treatment of mixed raw manure. A settling period of 8 h or more was necessary to significantly reduce the liquid fraction's total P concentration for both manure types. Reduction of  $\text{PO}_4\text{-P}$  varied from 96 to 100% in the liquid fractions for both manure types, which

along with natural settling, explains most of the total P reduction in that fraction. The addition of BPEF did not influence the N content of manure. The low P liquid fraction can be safely applied to saturated P soils whereas the high P solid fraction offers the opportunity of transporting manure to agricultural soils deficient in P. Since N is conserved, both liquid and solid fractions could be valuable fertilizer manure by-products.

CC Biochemistry studies - General 10060  
 Biochemistry studies - Minerals 10069  
 Soil science - General and methods 52801

IT Major Concepts  
 Biochemistry and Molecular Biophysics; Soil Science

IT Chemicals & Biochemicals  
 magnesium; phosphorus; phosphate

IT Miscellaneous Descriptors  
 manure; agricultural soil; liquid fraction; water eutrophication; byproduct of electrolysis and foundry

ORGN Classifier  
 Suidae 85740  
 Super Taxa  
 Artiodactyla; Mammalia; Vertebrata; Chordata; Animalia  
 Organism Name  
 pig (common)  
 Taxa Notes  
 Animals, Artiodactyls, Chordates, Mammals, Nonhuman Vertebrates, Nonhuman Mammals, Vertebrates

RN 7439-95-4 (magnesium)  
 7723-14-0 (phosphorus)  
 14265-44-2 (phosphate)

L80 ANSWER 2 OF 2 BIOSIS COPYRIGHT (c) 2009 The Thomson Corporation on STN

AN 2000:293634 BIOSIS Full-text

DN PREV200000293634

TI Method for dephosphorizing pig manure.

AU Kruidhof, Hendrik [Inventor, Reprint author]

CS Almelo, Netherlands

ASSIGNEE: Ceres Milieu Holding B.V., Enschede, Netherlands

PI US 5993503 19991130

SO Official Gazette of the United States Patent and Trademark Office Patents, (Nov. 30, 1999) Vol. 1228, No. 5. e-file.

CODEN: OGUPE7. ISSN: 0098-1133.

DT Patent

LA English

ED Entered STN: 6 Jul 2000

Last Updated on STN: 7 Jan 2002

AB The invention relates to a method for dephosphorizing manure, in particular pig manure, comprising of causing phosphate to dissolve, which phosphate is present at least partially in the form of phytate in the manure, separating the manure into a solid and a liquid fraction and removing the phosphate from the liquid fraction of the manure. Causing phosphate to dissolve can be achieved in different ways, for instance by storing the manure for a predetermined period of time under conditioned circumstances, or by sustaining a continuous movement of the manure at a temperature of at least 15degree C., preferably between 20 and 40degree C., to allow free escape therefrom of formed gases, or by the presence of means for complexing divalent ions, or by the enzymatic decomposition of phytate present in the manure. The phosphate is preferably removed from the liquid fraction by causing struvite to be precipitated therefrom.

NCL 071021000

CC General biology - Miscellaneous 00532

IT Major Concepts

best 2

Animal Husbandry (Agriculture); Methods and Techniques; Waste Management (Sanitation)

IT Methods & Equipment  
   dephosphorization of pig manure: waste management method  
 IT Miscellaneous Descriptors  
   pig manure

=> => d his

(FILE 'HOME' ENTERED AT 14:53:49 ON 05 FEB 2009)  
   SET COST OFF

FILE 'HCAPLUS' ENTERED AT 14:53:58 ON 05 FEB 2009

L1           2 S US20060144107/PN OR (US2006-536896# OR WO2003-CA1863)/AP, PRN  
 L2           1 S L1 NOT DESIGN/TI  
   E PARENT/AU  
 L3           1 S E3  
   E PARENT/G/AU  
   E PARENT G/AU  
 L4           20 S E3,E4  
   E SIMARD/AU  
   E SIMARD R/AU  
 L5           107 S E3,E7,E10-E12  
   E VALEEE/AU  
   E MANURE  
 L6           29528 S E3  
   E MANUR  
 L7           1254 S E3-E28 NOT L6  
   E MANURE/CT  
 L8           16151 S E3-E20  
   E E3+ALL  
 L9           16433 S E3,E6  
   E E2+ALL  
   E E2  
   E E3+ALL  
   E E13  
   E E3+ALL  
   E E2+ALL  
   E E2  
 L10          470 S E4  
 L11          31415 S L6-L10

FILE 'REGISTRY' ENTERED AT 15:13:47 ON 05 FEB 2009

L12          1 S 7723-14-0  
 L13          1 S 14265-44-2  
 L14          1 S 7664-38-2

FILE 'HCAPLUS' ENTERED AT 15:14:24 ON 05 FEB 2009

L15          267 S L12(L)REM/RL AND L11  
 L16          15 S L13(L)REM/RL AND L11  
 L17          2 S L14(L)REM/RL AND L11  
 L18          276 S L15-L17  
 L19          29 S L11 AND (DEPHOSPH? OR DE PHOSPH?)  
 L20          297 S L18,L19  
 L21          37 S L20 AND (BYPRODUCT OR BY PRODUCT)  
 L22          2 S L20 AND BPEF  
 L23          3 S L20 AND (FOUNDRY OR ELECTROLYSIS)  
   E FOUNDRY/CT

E FOUNDRY/CT  
 E E2+ALL  
 L24 1 S L20 AND E1  
 L25 1 S L20 AND SMELT?  
 L26 2 S L21 AND L23-L25  
 L27 3 S L22-L26  
 L28 2 S L1-L5 AND L20  
 L29 17 S L1-L5 AND L11  
 L30 15 S L29 NOT L28  
 L31 3 S L27,L28  
 L32 105 S L20 AND (MG# OR MAGNESIUM)  
 L33 11 S L32 AND L21-L28,L31  
 L34 8 S L33 NOT L31  
     SEL AN 2 5 6  
 L35 3 S L34 AND E1-E6  
 L36 6 S L31,L35

FILE 'REGISTRY' ENTERED AT 15:25:32 ON 05 FEB 2009

L37 84 S MG/MF  
 L38 16 S L37 NOT MASS

FILE 'HCAPLUS' ENTERED AT 15:25:40 ON 05 FEB 2009

L39 28 S L38 AND L20  
 L40 4 S L39 AND L21-L31  
 L41 2 S L40 NOT (144:455555 OR 137:299142)/DN  
 L42 24 S L39 NOT L40  
     SEL AN 3 17 23  
 L43 3 S L42 AND E7-E12  
 L44 8 S L35,L41,L43  
 L45 8 S L44 AND L1-L11,L12-L14,L15-L36,L38-L44  
 L46 8 S L45 AND (SWINE OR PIG OR WASTE OR LIQUID OR ?PHOSPHATE?)

FILE 'HCAPLUS' ENTERED AT 15:34:17 ON 05 FEB 2009

FILE 'AGRICOLA' ENTERED AT 15:34:33 ON 05 FEB 2009

E MANURE  
 L47 17829 S E3-E8,E10-E12  
     E MANURE/CTL  
     E E27+ALL  
 L48 9616 S MANURE?/CTL,CW  
     E PIG MANURE/CT  
     E E3+ALL  
     E E4+ALL  
 L49 4069 S E4 OR E5+NT OR E22 OR E65 OR E67  
 L50 17889 S L47-L49  
 L51 7 S L50 AND (DEPHOSPH? OR DE PHOSPH?)  
     E DEPHOSPHORYLATION/CTL  
 L52 2 S L50 AND E3  
     E DEPHOSPHORYLATION/CW  
 L53 7 S L51,L52  
 L54 7 S L53 AND L47-L50  
     E PIG MANURE/CT  
     E E3+ALL  
 L55 398 S E6  
     E E5+ALL  
 L56 3192 S E5+NT  
 L57 7 S L56,L50 AND (DEPHOSPH? OR DE PHOSPH? OR DEPHOSPHORYLATION/CTL  
 L58 7 S L54,L57  
 L59 490 S L50 AND (BYPRODUCT OR BY PRODUCT)  
 L60 2 S L59 AND (FOUNDRY OR SMELT?)

L61           1 S L60 AND SWINE  
              E ANIMAL MANURE MANAGEMENT/CT  
              E ANIMAL MANURE MANAGEMENT/CTLC  
L62           355 S E3  
              E INDUSTRIAL BYPRODUCT/CTLC  
L63           1 S E4 AND L62  
L64           1 S L61,L63

FILE 'AGRICOLA' ENTERED AT 15:42:52 ON 05 FEB 2009

L65           1 S BPEF AND L50,L62

FILE 'BIOSIS' ENTERED AT 15:43:26 ON 05 FEB 2009

L66           21224 S MANURE  
              E MANURE/CT  
L67           337 S MANURE?/CT  
L68           21224 S L66,L67  
L69           9 S L68 AND (?DEPHOSPH? OR DE PHOSPH?)  
L70           1 S L69 AND 2000:293634/AN  
L71           5280 S L68 AND ?PHOSPH?  
L72           3756 S L68 AND L12-L14  
L73           5280 S L71,L72  
L74           1 S L73 AND BPEF  
L75           16 S L73 AND (BYPRODUCT? OR "BY PRODUCT")  
L76           213 S L73 AND PRODUCT  
L77           224 S L74-L76  
L78           39 S L77 AND (FOUNDRY OR SMELT? OR INDUSTR?)  
L79           1 S L78 AND 2007:284791/AN  
L80           2 S L70,L79

FILE 'BIOSIS' ENTERED AT 15:50:26 ON 05 FEB 2009

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